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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,420	03/06/2001	Kevin David Sanderson	1-15240	5624

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EXAMINER

FULLER, ERIC B

ART UNIT

PAPER NUMBER

1762

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/744,420		SANDERSON, KEVIN DAVID	
	Examiner		Art Unit	
	Eric B Fuller		1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 34-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 and 34-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Response to Amendment

On the preliminary amendment filed January 24, 2001, the phrase "Summary of Invention" has not been entered due to the improper location requested. Correction is requested.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the

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claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 3 recites the broad recitation "tungsten oxychloride", and the claim also recites "preferably tungsten oxytetrachloride" which is the narrower statement of the range/limitation.

In claim 23, "the float glass production process" lacks antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
- (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1, 5-8, 34-35, 40-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Saegusa et al. (US 6,126,743).

Saegusa teaches a process of coating a glass substrate that may or may not be all ready coated (column 11, lines 25-30) and is heated to 300-900 degrees Celsius.

The coating to be applied may comprise tungsten oxide. Directing gaseous tungsten chloride and an oxygen source, in the form of oxygen, performs the deposition (column

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5, lines 15-18, line 47). Ethyl acetate may be used as a solvent (column 7, line 50), which reads on being a source of oxygen as well. The product of this reference reads on claim 42.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saegusa et al. (US 6,126,743).

Saegusa teaches the limitations of claim 1, as shown above. As to claim 4, the reference fails to teach that the tungsten chloride is substituted. However, Saegusa does teach that the precursor is either tungsten chloride or tungsten ethoxide (column 5, lines 15-20). It is the examiner's position that one of ordinary skill in the art would recognize that by the reference teaching that the ligands of tungsten precursor being capable of being either chloride or ethoxide, that it is implied that the ethoxide substituent and the chloride substituent behave the same way in the reaction-deposition process. Therefore, it would have been obvious that if a tungsten precursor with a chloride ligand may be used, and a tungsten precursor with an ethoxide ligand may be used, then one of ordinary skill in the art would have a reasonable expectation to believe that a tungsten precursor containing chlorides and ethoxides as its ligands

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would succeed in performing the process as taught. To use the substituted precursor would have been obvious at the time the invention was made to a person having ordinary skill in the art with the expectation of achieving similar results.

As to claim 18, Saegusa fails to teach the growth rate of the deposited film. However, to achieve maximum rate without sacrificing film quality would have been obvious and within the skill of one practicing in the art, absence evidence of criticality.

Claims 1, 2, 5-8, 10-16, 18, 23, 34-35, and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riaz et al. (US 5,385,751) in view of Saegusa et al. (US 6,126,743).

Riaz teaches a method of coating a glass substrate (column 3, line 23) with a fluorine-doped tungsten oxide layer. The process may occur during the well-known float glass process (column 3, line 20). The temperature of the substrate is between 300-500 degrees Celsius (column 3, line 17). Riaz teaches that trifluoroacetic acid, as the fluorine source for doping, may be simultaneously added to a gas stream that comprises tungsten alkoxides and an oxygen source (column 2, line 54). Riaz also teaches a method of entraining the tungsten precursors where nitrogen is used as the carrier gas (column 3, lines 58-68).

The reference fails to teach the use of a tungsten chloride as the tungsten precursor. However, Saegusa, as shown above, teaches that either tungsten chloride or tungsten ethoxide, an alkoxide, may be used as the precursor for depositing a tungsten oxide film. From this teaching, it would be obvious at the time the invention

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was made to a person having ordinary skill in the art that tungsten chloride may be used in place of tungsten ethoxide with a reasonable expectation of achieving similar results, as both precursors contain ligands that react similarly to the process conditions. Therefore, it would have been obvious to use tungsten chloride, and any suitable solvent as taught by Saegusa, as the precursor for the method taught by Riaz. By doing so, similar results are expected.

As to claim 15, it was shown above that an entraining method was taught by Riaz for the precursors. However, the reference is silent using an entraining method for vaporizing solvents. It also has been shown above that it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize the tungsten chloride and the ester solvent as the precursor in the process taught by Riaz. The references are silent to the vaporizing the solvent. However, as a simple method of vaporizing has been taught for the other species, it is the examiner's position that one of ordinary skill in the art would recognize that vaporizing the ester by the same entraining method as the precursors, would result in satisfactory results. Therefore, to do so would have been obvious at the time the invention was made to a person having ordinary skill in the art.

As to claims 13, 16, 38, and 39, Riaz fails to teach the temperatures of the species being vaporized as they are entrained. However, it is well known in the art to use a temperature just below the melting point of the material, since the material is heated but still remains a solid. The applicant's claimed ranges fall within this range.

As to claim 18, Riaz fails to teach the growth rate of the deposited film. However, to achieve maximum rate without sacrificing film quality would have been obvious and within the skill of one practicing in the art, absence evidence of criticality.

All other limitations have been address above for being anticipated by Saegusa.

Claims 1, 2, 5-9, 17-22, 34-37, and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallego et al. (US 6,048,621) in view of Saegusa et al. (US 6,126,743).

Gallego teaches a process of coating a glass substrate by first coating it with an underlayer of silicon, carbon, and oxygen (column 3, lines 40-45). Then a layer of tungsten oxide, in a non-stoichiometric amount, is deposited on the underlayer (abstract, column 2, lines 24-33) with a thickness of 50 nm to 500 nm (column 2, lines 43-45). Then an overlayer of fluorine doped tin oxide is deposited upon that layer (column 3, lines 50-65). The reference teaches that the stoichiometry is altered by altering the flow of oxygen, but fails to teach the precursors for depositing the tungsten oxide layer.

However, as it has been shown above, it would have been obvious at the time the invention was made to a person having ordinary skill in the art from viewing Saegusa to utilize the tungsten chloride and suitable solvents in order to produce the tungsten oxide layer of Gallego. By doing so, one would have a reasonable expectation of success in achieving the taught process.

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As to claim 18, Gallego fails to teach the growth rate of the deposited film. However, to achieve maximum rate without sacrificing film quality would have been obvious and within the skill of one practicing in the art, absence evidence of criticality.

As to claim 43, Gallego teaches the multiple-glazing unit with the coated glass in spaced opposed relation to the glazing plane (column 4, lines 38-45).

All other limitations not address here are rejected to as being anticipated by Saegusa, as shown above.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallego et al. (US 6,048,621) or Riaz et al. (US 5,385,751), each individually in view of Saegusa et al. (US 6,126,743) and in further view of Tracy et al. (US 4,687,560), or, alternatively, Saegusa et al. (US 6,126,743) in view of Tracy et al. (US 4,687,560).

Three different grounds for rejection have been used to reject claim 1. All of these references fail to teach the use of tungsten oxytetrachloride as the precursor for the tungsten oxide layer. However, Tracy teaches a method of depositing a tungsten chloride layer by CVD that uses oxytetrachloride as the precursor. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to use oxytetrachloride in any of the above mentioned processes as the tungsten source. By doing so, one skilled in the art would expect to achieve similar results.

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Claims 1-3, 8, 10-14, 18, 23, 34, 38 – 40, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Proscia (US 5,286,520) in view of Tracy et al. (US 4,687,560).

Proscia teaches a method of coating a glass substrate (column 4, lines 25-30) with a fluorine-doped tungsten oxide layer. The process may occur during the well-known float glass process (column 3, lines 45-50). Proscia teaches that trifluoroacetic acid, as the fluoride source for doping, may be simultaneously added to a gas stream comprising oxygen and tungsten hexafluoride (column 3, line 33). Proscia also teaches a method of entraining the tungsten precursors where nitrogen is used as the carrier gas (column 4, lines 13-22).

The reference fails to teach the use of a tungsten chloride or an oxyhalide as the tungsten precursor. However, Tracy teaches that either tungsten chloride or tungsten oxytetrachloride may be used as the precursor in place of tungsten hexafluoride for depositing a tungsten oxide film. From this teaching, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize either tungsten oxytetrachloride or tungsten chloride as the precursor for the process taught by Proscia.

Examiner acknowledges that the temperature range given by Proscia is less than what is claimed by the applicant. However, the examiner takes official notice that it is well known that, generally, as the substrate temperature is increased in a reaction CVD process such as this, the deposition rate is increased as there is more energy being supplied to the reaction with the limiting agent being the oxygen's accessibility to the

ligand of the precursor. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the temperature such that deposition rate is increased without damaging the substrate or allowing pre-mature decomposition.

Additionally, it is pointed out that "where the principal difference between the claimed process and that taught by the reference is a temperature difference, it is incumbent upon applicant to establish criticality of that difference." See *Ex parte Khusid*, 174 USPQ 59.

As to claims 13, 38, and 39, Proscia fails to teach the temperatures of the species being vaporized as they are entrained. However, it is well known in the art to use a temperature just below the melting point of the material, since the material is heated but still remains a solid. The applicant's claimed ranges fall within this range.

As to claim 18, Proscia fails to teach the growth rate of the deposited film. However, to achieve maximum rate without sacrificing film quality would have been obvious and within the skill of one practicing in the art, absent evidence of criticality.

Claims 1-3, 8, 34, 35, 40, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dai et al. (XP-002123373).

Dai teaches a process of applying a tungsten oxide film to a silica substrate that is coated with indium-tin oxide by a plasma enhanced CVD method (page 408, lines 1-10). The precursor is tungsten oxytetrachloride mixed with oxygen.

The only difference between the reference and the applicant's claim 1 is the substrate temperature. As shown above, it is incumbent upon applicant to establish criticality of the temperature difference.

Additionally, it is taught by the reference that deposition rate is dependent upon substrate temperature. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the temperature such that deposition rate is increased without damaging the substrate or allowing pre-mature decomposition. As shown above, it is known that generally an increase in temperature would cause an increase in deposition rate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Tuesday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached at (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

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EBF

May 20, 2002



TIMOTHY MEEKS
PRIMARY EXAMINER